

Bellwork: 1/7/13

Graph the following quadratic function on the grid provided

$$y = -2(x-3)^2 + 8$$

1) Axis of Symmetry: $x=3$

2) Vertex: $(3, 8)$

3) Opens? ↓

4) y-intercept: (x=0) $(0, -10)$

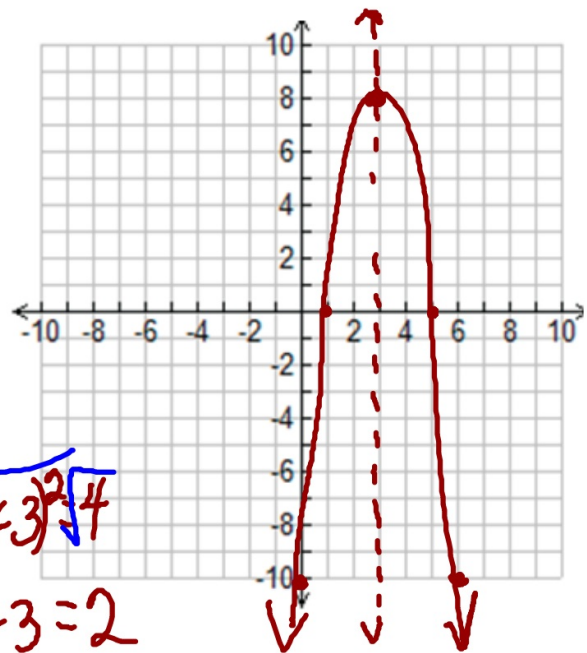
$$-2(0-3)^2 + 8 = -10$$

5) x-intercepts: (y=0) $(5, 0)$ $(1, 0)$

$$-2(x-3)^2 + 8 = 0 \quad \sqrt{(x-3)^2} \quad 4$$

$$\frac{-2(x-3)^2}{-2} = \frac{-8}{-2} \rightarrow x-3=2$$

$$x=5$$



$$y = -2|x-3| + 8 \quad (\neq) \quad y = -2(x-3)^2 + 8$$

over 1 up 1

over 1 up 1

over 2 up 2

over 2 up 4

over 3 up 3

over 3 up 9

$$y = -2(x-3)^3 + 8$$

$$y = -2\left(\frac{1}{x-3}\right) + 8$$

$$y = -2\sqrt{x-3} + 8$$

$$y = -2(\log x - 3) + 8$$

4.6 - Solving Quadratic Equations using the Quadratic Formula

Some quadratic equations are not factorable. If you are asked to solve a quadratic equation and it is not factorable, you must use the **QUADRATIC FORMULA** to solve.

Quadratic Formula:
$$x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$$

**** Equation must be equal to zero to use the quadratic formula. ****

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1) $x^2 - 5x - 7 = 0$
 $a = 1 \quad b = -5 \quad c = -7$

$$\frac{5 \pm \sqrt{(-5)^2 - 4(1)(-7)}}{2(1)}$$

$$\frac{5 \pm \sqrt{53}}{2}$$

$$\left(\frac{5 + \sqrt{53}}{2}, 0 \right) \left(\frac{5 - \sqrt{53}}{2}, 0 \right)$$

$(6.1, 0) \quad (-1.1, 0)$

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$$2) \quad 2x^2 - x - 4 = 0$$

$$a=2 \quad b=-1 \quad c=-4$$

$$\frac{1 \pm \sqrt{(-1)^2 - 4(2)(-4)}}{2(2)}$$

$$\boxed{\frac{1 \pm \sqrt{33}}{4}}$$

$$\left(\frac{1 + \sqrt{33}}{4}, 0 \right) \quad \left(\frac{1 - \sqrt{33}}{4}, 0 \right)$$

$$(1.6, 0) \quad (-1.2, 0)$$

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$$3) \quad x^2 + 3x = 13$$

$$x^2 + 3x - 13 = 0$$

$$a=1 \quad b=3 \quad c=-13$$

$$\frac{-3 \pm \sqrt{(3)^2 - 4(1)(-13)}}{2(1)}$$

$$\frac{-3 + \sqrt{61}}{2}$$

$$\frac{-3 + \sqrt{61}}{2}$$

$$\frac{-3 - \sqrt{61}}{2}$$

$$(2.4, 0)$$

$$(-5.4, 0)$$

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$$4) 3x^2 = 4x + 3$$

$$\textcircled{5} -x^2 - 7x - 4 = 0$$

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